

Measuring and Estimating

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Overall Goal for the Lesson:

Students will be able to estimate the length of well-known, two-dimensional and three-dimensional linear objects. Students will understand the concept of “one inch”.

Description of classroom, grade level, and students:

This lesson is geared towards a special education classroom, containing students with mild to moderate disabilities. The age level for this lesson will range from 3rd to 5th grade.

Student Objectives for the lesson. (Given a condition, the students will, to what level).

Given a well-known object, the student will be able to estimate how long the object is, in inches, with 75% accuracy.

Given a piece of yarn of X length, the student will be able to cut 1 inch pieces, while using a metric ruler, with 100% accuracy.

Length of Lesson: (minutes, number of class periods, or days or weeks needed).

- 45 minutes, over one class period

Schedule of Activities: (Break down your activity into a timeline of events. Focus on what students will be doing and what teachers will be doing during each part of the activity.)

1. In a special education classroom, students will vary in their knowledge of what “an inch” is. Spend the beginning of the lesson discussing what an inch is (a measurement unit), what inches are used for (to measure items that are relatively small), and how big an inch is (approximately the size of the width of two fingers)
2. Have students hold up two fingers, and explain to them that an inch is APPROXIMATELY the length of the width of two of their fingers.
3. Read the story “Inch by Inch” by Leo Lionni. This story is about an inchworm that is incredibly proud of his ability to measure anything and everything

- that he can.
4. After the book is finished, explain that today we are going to estimate and measure in inches. Discuss the definition of “estimate”, and explain how an estimation is a lot like an educated guess regarding something, and that they are useful when people do not have rulers around to help them. Also explain that the closer that we get to the actual number, the more accurate or correct estimation is.
 5. Have students get out their rulers, so that they can visually see how long an inch actually is, and then put them away.
 6. Explain to the class that they will not be making estimations about the length of some different items that are around the classroom.
 7. Each group will receive 3 items: An unsharpened pencil, a piece of computer paper, and a paper clip. Have the students “estimate” how long each item is in inches. As the students are estimating, have them record their answers on the class wikipage.
 8. When all groups are done estimating, have the class focus at the front of the room. Bring up the wikipage so that all groups can see. Have the students compare each others answers (the point is to have students realize that all of their estimations may have been different).
 9. Have the students go back into their groups. This time, students are going to get out their rulers and re-measure the items for accuracy. Have the students record their answers on your wikispace.
 10. Discuss the class findings. Did everyone get the same answers?
 11. Pass out the assessment to the students (as described in the section below titled “assessment: How will these activities be assessed?” The assessment is also available on the class wikipage.

PASS Content Standards Addressed:

Standard 4: Measurement - The student will solve problems using appropriate units of measure in a variety of situations.

1. Measurement
 - a. Estimate the measures of a variety of objects using customary units.
 - b. Establish benchmarks for metric units and estimate the measures of a variety of objects (e.g., mass: the mass of a raisin is about 1 gram, length: the width of a finger is about 1 centimeter)..

PASS Instructional Technology Standards:

Standard 3: The student will demonstrate knowledge of technology productivity tool.

2. Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication,

and publishing activities to create knowledge products for audiences inside and outside the classroom.

Assessments: How will these activities be assessed?

1. Assessment: The children will complete a worksheet (this worksheet is in PDF form on the same wikipage where the students will be doing their lesson). In the assessment, the students will be given a 20 inch piece of yarn. They will have to cut the yarn into pieces that are 1 inch long. They will then use paste the pieces of yarn on their worksheets, to figure out how long the item is, and will then record their answer. For example, there may be a picture of a pen on the sheet the worksheet. The students will line up 1 inch pieces of yarn underneath the drawing, and how every many pieces it takes, it how many inches long the item is.
2. Make sure that the students are gluing down the pieces of yard. Also, make sure that each student has 20 individual pieces; if a student has measured wrong, they may have less or more than 20 pieces of string.

Accommodations: How might the lesson need to be adapted for students with special needs?

Environmental accommodations

- widened isles
- preferential seating
- raised work surface table

Presentation:

- Directions will be given verbally, as well as presented on the smart board. Students can also receive a printed version of the directions if need be.

Materials:

- help will be provided with gluing string down
- students with special needs can have pre-cut pieces of string

Guided practice:

- extended time to finish
- group work

Materials Needed: Go through each activity and identify what items (both technology and not) are needed to complete this lesson. Include a breakdown according to individual student or student groups. Include materials that need to be created as well.

- “Inch by Inch” by Leo Lionni
- Rulers
- Unsharpened pencils (5)
- Pieces of computer paper (5)
- Paper clips (5)
- Access to wikispace for each group as well as teacher access
- Assessment worksheets (in PDF form on wikispace)
- 20 inch pieces of string (one for each student)
- Child-proof scissors
- Glue